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At a glance: How to administer a flu vaccination by Kevin Murphy

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Abstract:	‘Flu Season’ is a well-established annual occurrence in primary care services. Flu complications lead to tens of thousands of hospital stays and often averages over 600 deaths in the United Kingdom (UK) annually. Concerns have been raised by GP’s to cope with the demand of flu vaccinations, with up to 30 million people being included in the expansion of what will be the most comprehensive flu vaccination programme in UK history. No vaccine offers 100% protection and a proportion of individuals may still become infected despite vaccination, a common misconception amongst the public. The topic of mandatory flu vaccinations for employees remains a controversial topic. The implications of enforcing employees contractually to receive an immunisation could potentially generate significant confrontation and protest. Practitioners must have undertaken appropriate training relevant to the supply/administration of medicines as well as demonstrable competence in immunisation, management of the cold chain and able to recognise and manage anaphylaxis. . The influenza vaccine should be administered by intramuscular injection, preferably into the deltoid region of the upper arm and care taken to avoid injury. After administering the vaccine, the patient should be monitored for any ADR’s (adverse drug reactions).

How to: Administer a Flu Vaccination

'Flu Season' is a well-established annual occurrence in primary care services. A range of practitioners administer influenza vaccinations, including district and community nurses, practice nurses, GP's and pharmacists. Flu is a very common and infectious virus, far more severe than the common cold that can easily spread to other people (NHS, 2020). The University of Oxford (2020) stated flu complications lead to tens of thousands of hospital stays, averaging over 600 deaths in the United Kingdom (UK) annually. Several unpleasant symptoms can present in a case of the flu *(Box. 1)*. Mahase (2020) highlights the concerns raised by GP's to cope with the demand of flu vaccinations, with up to 30 million people being included in the expansion of what will be the most comprehensive flu vaccination programme in UK history (Mathew, 2020). However, the Department of Health (DH) are currently in consultation to expand the remit of the current workforce to allow the ability to vaccinate, including nursing associates and operating department practitioners (ODP's) as well as paramedics, midwives and physiotherapists (DH, 2020). Mahase (2020) however advises caution, warning that the additional workforce would require training to meet expected standards of patient safety. Mathew (2020) argues the flu vaccination programme will be one of the most important preventative exercises that will be undertaken in this pandemic and a failure to receive government help could leave primary care overwhelmed. The World Health Organisation (WHO, 2020) interestingly reported the worldwide situation of the influenza virus however has decreased considerably in contrast to this time in previous years, likely due to mandatory social distancing and stricter hygiene protocols, although this could be a concern as well as providing reassurance (Balakrishnan, 2020).

Box 1. Common flu Symptoms
• Sudden fever- a temperature of 38C or above
• Aching body
• Tired or exhausted
• Dry cough
• Sore throat
• Headache
• Difficulty sleeping
• Loss of appetite
• Diarrhoea or stomach pain
• Nausea/vomiting

Box 1. Source: adapted from NHS UK, 2020

The vaccine

Eligible people will be offered a vaccine most effective for them, depending on age as shown *(Fig. 1)* based on evidenced criteria. The flu vaccination is the best protection available against an often unpredictable virus that can cause both unpleasant illness and death. Studies have shown that the flu vaccine will help prevent individuals getting the flu however it will not stop all flu viruses (NHS, 2020). The benefits of avoiding or reducing the effects of the flu are not the only potential benefits of the vaccine. Mayor (2018) highlights results of a Danish observational study showing a 20% reduction in mortality for patients with heart failure who had received a flu vaccination, due to the risk of decompensation caused by influenza to the decreased circulatory reserve, particularly in frail and elderly patients. No vaccine offers 100% protection and a proportion of individuals may still become infected despite vaccination, a common misconception amongst some of the general public. Inactivated vaccines are used with individuals aged above 18 years old. A first injection of an inactivated vaccine without prior exposure to the antigen will produce a primary antibody response. Antibodies may persist for months or years, and even if detectable antibody count falls, individuals may still be protected (PHE, 2018). However, Haralambieva et al. (2015) state there is considerable evidence that immune responses substantially decline with age. With influenza, further seasonal reinforcement doses are used to boost immunity and provide longer term protection.

Age Group	Recommended Vaccine	Live vaccine?	Types of flu strains protected	Reason for recommendation
Children aged 6 months to 2 years	Egg-grown quadrivalent vaccine (QIVe)	**No**	**Four**	LAIV is not suitable for children under two
Children aged 2 – 17 years	Live attenuated influenza vaccine (LAIV)	**Yes**	**Four**	Nasal vaccine helps to reduce spread of flu virus in children
Adults aged 18 – 64 years	Quadrivalent influenza vaccine: Egg-grown (QIVe) Cell-based (QIVc)	**No**	**Four**	Quadrivalent vaccines protect against four types of flu strain
Adults aged 65 or over	Adjuvanted trivalent influenza vaccine (aTIV)	**No**	**Three**	"Adjuvant" is added to the vaccine to make it more effective in older people

Fig. 1 Source: University of Oxford, 2020

Mandatory flu vaccinations and their effectiveness

The topic of mandatory flu vaccinations for employees remains a controversial topic. In 2019, England's then Chief Medical Officer Alison Davies suggested it should be a contractual duty, an opinion shared by Sir Bruce Keogh, medical director of NHS England (Brocklehurst, 2018). Uptake figures showed in 2019 that 70.3% of all eligible frontline staff had received a flu vaccination, only a slight increase from the previous year. In Scotland, this fell to 40% for all NHS workers (Brocklehurst, 2018). The implications of enforcing employees contractually to receive an immunisation could

potentially generate significant confrontation and protest. McCartney (2018) advises it would be a mistake to make this mandatory, warning that flu vaccinations may not be greatly beneficial and forcing staff to receive an annual vaccine of uncertain effectiveness would be a concern. McCartney further argues that other priorities would favour review, such as safe staffing rations and bed numbers. Dyer (2017) discusses the case of American company 'Essentia Health', who fired 69 of their 14,000 employees who failed to be vaccinated or provide an exemption request form; one year later in 2017, their compliance, reached 99.5%. PHE published their 'Influenza Vaccine Effectiveness' results which showed the vaccines effectiveness in under 65-year olds was 41% in 2016-2017 (PHE, 2017). Further evidence provided from the University of Oxford (2020) suggested that the inactivated flu vaccine did not work at all for people aged over 65 in 2016-17, which resulted in an adjuvant (MF59) being introduced for the 2018-19 season. MF59's main ingredient is squalene oil which is a naturally occurring oil in humans, plants and animals. MF59 is only found in 'Flaud', the inactivated targeted vaccine for adults 65 and over. Yang et al's. (2020) systematic review supported the benefits of the MF59 adjuvant in over 65's and advised that this could improve protection in the future for what is universally recognised as a vulnerable age group. Blackmore (2018) argues the benefits outweigh not receiving the vaccine, stating little evidence has been provided to demonstrate any negative effects of receiving a vaccination. Blackmore (2018) also suggested a "presumed consent" system where staff would opt-out, similar to organ donation. Thomas, Jefferson and Lasserson (2016) advised benefits are best seen for staff working in care homes, showing lower death rates and health service use where home care staff are vaccinated. Making staff vaccinations mandatory for influenza will continue to pose ethical and legal challenges, however objective and valid evidence for those particularly under the ages of 65 may continue to prevent staff being persuaded to agree to annual vaccinations of contrasting effectiveness. This is further supported by Mounier-Jack et al's (2020) qualitative study which suggested a more positive culture favouring non-coercion yielded more adherence from staff.

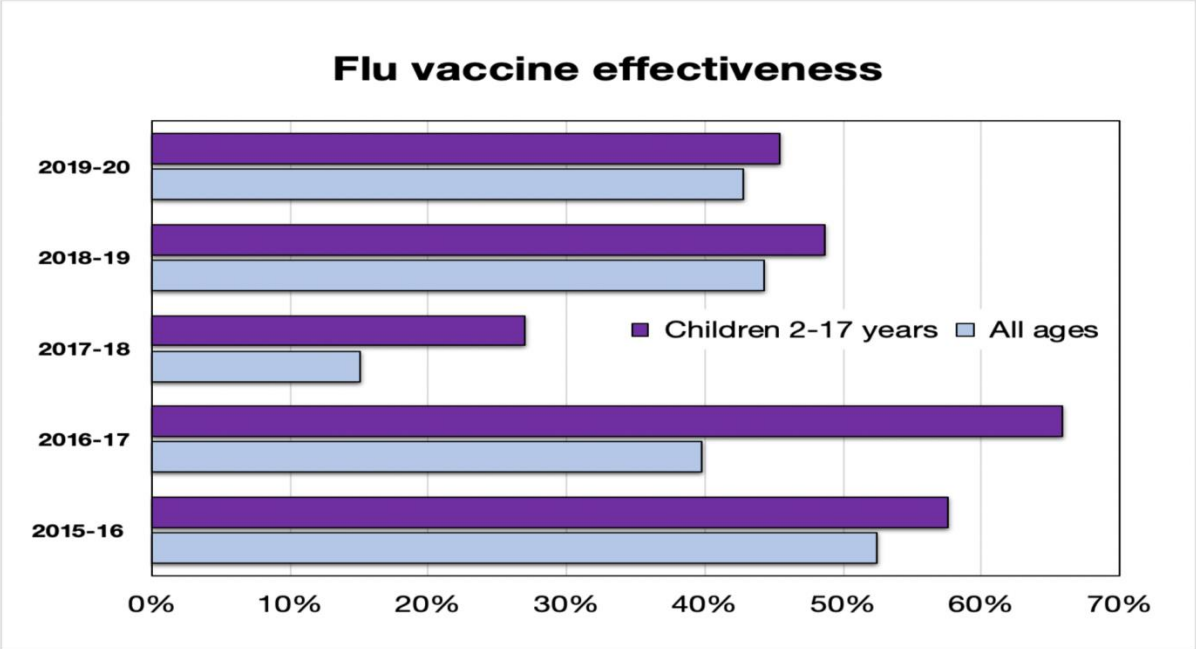

Fig 2. Source: University of Oxford, 2020

Practitioner requirements

Public Health England (PHE, 2020) has recently published their influenza Patient Group Direction (PGD) that all practitioners must adhere to. Only registered professionals are allowed to legally supply and administer under a PGD, not exclusive to the following:

- Nurses and midwifes currently registered with the Nursing and Midwifery Council (NMC)
- Pharmacists registered with the General Pharmaceutical Council (GPhC)
- Podiatrists, dieticians, occupational therapists, paramedics, physiotherapists and others registered with the Health and Care Professionals Council (HCPC)

Practitioners must have undertaken appropriate training relevant to the supply/administration of medicines as well as demonstrable competence in immunisation, management of the cold chain and able to recognise and manage anaphylaxis (PHE, 2020). Despite the pressures faced by primary care services throughout the pandemic, staff must not feel pressured to undertake any procedure or skill they do not feel confident in delivering. As registered professionals across different specialities, practice is governed by a code of conduct which must be adhered to, including recognition of one's own limitations and the need to practice safely.

This is especially important when considering inclusion and exclusion criteria. As the medication falls under a PGD, practitioners are responsible for ensuring the patient receiving the vaccine receives appropriate assessment. If a patient falls outside of the PGD criteria, a PSD (Patient Specific Direction) will need to be obtained from an appropriate prescriber to administer in line with any updated recommendations (PHE, 2020). Criteria for exclusion (PHE, 2020), include individuals who are:

- Less than 6 months old
- Aged 2-18 years for whom live attenuated influenza vaccine (LAIV) is not contraindicated
- Have had a previous confirmed anaphylactic response to the vaccine or with any of its parts/ingredients
- Aged less than 9 years of age and experienced a severe anaphylactic reaction to egg which has required intensive care treatment
- Received a complete dose of the recommended influenza vaccine for the current season
- Suffering from acute severe febrile illness.

The presence of a minor infection is not a contraindication although administering practitioners often err on the side of caution and avoid until the patient is feeling well. Professionals need to gain informed consent from patients or from a person legally able to act on the persons behalf for each administration. A discussion should take place advising the patient or legally responsible individual of any risks by not receiving the vaccine.

The 'Cold Chain'

The 'cold chain' is a term used to define expectations for the storage of certain products requiring refrigeration or to be stored at an optimum temperature; NICE (2020) guidelines advise this is between +2 and +8 degrees Celsius. Best practice will also involve the vaccines being stored in the original product packaging so batch numbers and expiry dates can be retained. Vaccines may lose their effectiveness if not stored correctly. Storage outside the recommended manufacturer temperature, even during transport can increase the speed of loss of potency, which is irreversible

(PHE, 2019). If vaccines were to be used after being incorrectly stored and temperature controlled, they are no longer within the terms of the product license and a violation of the manufacturer's guidance. Community teams would benefit from nominated, responsible people who would order, receive and ensure correct care is given to the vaccines. Other good practice includes rotating stored vaccine stocks so expiry dates can be monitored, designating areas where staff know where the fridges will be and also ensuring the vaccines are quality checked and counted daily, including the review of a refrigerator thermometer. Any failure in the cold chain needs immediate escalation to line managers and adherence to local protocols. A rapid assessment should take place to form an action plan (PHE, 2019).

Consent

Adults are those aged 18 or over and must consent to any treatment being received. Although the patient may have had the vaccine or treatment before, ensuring this consent is still valid is essential. The NMC (2018) code of conduct provides nursing professionals with clear expectations of their accountability and a failure to obtain or seek appropriate consent could leave the professional vulnerable to legal action. Where patients are unable to give consent, the patients GP in consultation with relatives or those with a health specific Lasting Power of Attorney (LPA) can make a decision to administer, as long as the risks of administration do not pose potential for harm (PHE, 2019).

Administration of the Influenza Vaccine

Safety checks should be performed to ensure the vaccine is safe to give. Practitioners should ensure the vaccination has not surpassed its expiry date and ensure the cold chain has not been broken. The practitioner should also check the vial septum is clean and the vaccine undamaged in any way. The influenza vaccine should be administered by intramuscular injection, preferably into the deltoid region of the upper arm and care taken to avoid injury (see fig. 3). Caution is advised in those patients who are experiencing coagulation difficulties such as haemophilia or thrombocytopenia which may be poorly controlled (NICE, 2020). Patients with bleeding disorders can be vaccinated intramuscularly if authorised by a doctor familiar with the risks associated with the patient. The deep subcutaneous route is advised in those patients where risks have been identified, however PHE (2019) guidance advises there is a lack of evidence that administration via the subcutaneous route is any safer for those patients taking anticoagulants, with potential associated risks with localised reactions.

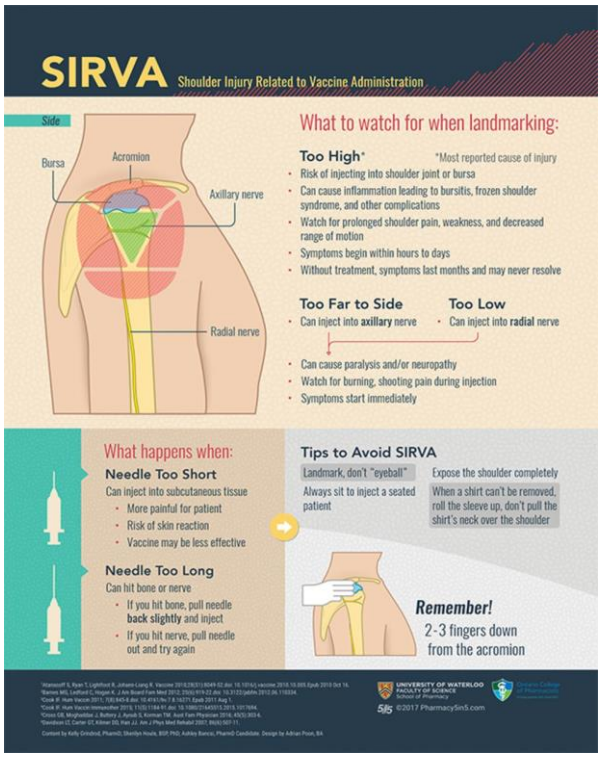

Fig 3. Taken Bancsi, Sherilyn and Grindrod 2018.

Immunisations should not be given into the gluteus maximus as this could cause sciatic nerve damage and the risk of injecting the vaccine into fatty tissue rather than muscle (PHE, 2019).

If the skin is clean, no further cleaning is necessary. Skin that is visibly dirty or soiled will need washed with warm, soapy water prior to injection (PHE, 2019). Needle choice is not usually an issue for administering staff, as flu vaccines are already often prepared with a 23 or 25 gauge needle (PHE, 2020). However, with morbidly obese patients a risk assessment may need to be carried out by a qualified practitioner which will help gauge if another administration method is needed. Immunisations into the deltoid muscle should be given at a 90 degree angle with the skin stretched, not bunched. No aspiration is required once the needle is in the muscle. If the patient requires a deep subcutaneous injection, this should be done at a 45 degree angle with the skin bunched, contrary to the intramuscular technique.

After administering the vaccine, the patient should be monitored for any ADR's (adverse drug reactions). Pain, swelling and redness at the location of the injection site can be commonly reported, as well as fever, tiredness/lethargy, headache and myalgia (PHE, 2019; NICE, 2020). Most often, these symptoms disappear after 1-2 days without treatment, with some patients often misappropriating this with 'getting the flu' after having a vaccination. Practitioners should monitor the patient immediately after vaccination for any indications of anaphylaxis, bronchospasm and urticaria (PHE, 2019). If anaphylaxis were to occur, staff should have adrenaline available and follow NICE (2020) national guidelines for the management of acute anaphylaxis; reinforcing the need for staff to be trained and competent in its management before administering any medications.

To ensure accountability and transparency, documentation should then occur which reflects the consultation with the patient. PHE (2018) advises the following are recorded:

- Vaccine name, product name, batch number and expiry
- Dose administered and specific route
- Date given, name and signature of vaccinator.
- Details of consent provided

Information can be recorded either electronically or hand-written. Most GP surgeries and community teams use a method of electronic recording, often using the primary patient record on SystmOne or EMIS. Practitioners should ensure the information provided is accurate, clear and concise as per NMC (2018) expectations and in conformance with local information governance guidelines.